

REMARKS

Applicant's undersigned representative thanks the Examiner for his telephone call of January 22, 2007, responding to the representative's question about the Applicant-Applied Prior Art (AAPA).

Applicant has added no new matter as defined within the scope of 35 USC 132. Applicant includes with this response a marked up set of the amended claims.

1. Amendment of Claims 1 and 8

Claims 1 and 8 and claims depending therefrom have been amended to more precisely claim the present invention's advantageous method of producing sanitaryware using interchangeable elements (and, more precisely, interchangeable shell, engine and rim configurations). The claim amendments are supported by the specification at page 8, line 23 to page 9, line 3; page 14, lines 1 to 12; and page 17, line 15 to page 19, line 11 (which describe further support for the claim amendments via reference to Figures 11, 12 and 13). Applicant respectfully requests entry of these claim amendments.

2. Rejection of Claims 6 and 7 Under 35 USC 112, Second Paragraph

The Examiner has rejected dependent claims 6 and 7 under 35 USC 112, para. 2, which states:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

The Examiner particularly refers to the term "special" in claims 6 and 7 as comprising a relative term which renders the claims indefinite. Applicant has therefore amended claims 6 and 7 to remove the term "special" therefrom.

3. Rejection of Claims 1 to 5 for Obviousness Under 35 USC 103(a)

The Examiner has rejected independent claim 1, and claims 2 to 5 depending therefrom, as being unpatentable for obviousness under 35 USC 103(a) over US Patent No. 6,428,643 to Bergquist (“Bergquist”) in view of US Patent No. 3,843,977 to Garnett (“Garnett”).

35 USC 103(a) states:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Bergquist (filed on November 19, 1999, issued on August 6, 2002 and expiring on November 19, 2019) discloses a method and apparatus for casting a plumbing fixture. Bergquist particularly addresses casting of toilet bowls having substantially closed rims. In the claimed method, a bowl portion of a plumbing fixture is cast in an inverted position while a rim portion is cast separately therefrom. The rim portion is brought into communication with the bowl portion while both pieces are inverted greenware and the bowl portion remains in contact with side mold parts. The joined bowl and rim portions are permitted to dry thereafter while the joined piece remains inverted until a complete bond is effected.

Garnett (now expired) discloses a sanitary fixture fabricated from a plurality of sheetlike shell sections that form inner surfaces and thereby define the fixture’s internal cavity. A fluid, settable core member is disposed in the cavity and adheres to the inner surfaces so as to structurally and permanently interconnect the shell sections. In the

disclosed fixture, fabrication is achieved with ubiquitous die-forming and filling techniques.

Bergquist does not disclose, teach or suggest the present invention according to claim 1 and claims depending directly or indirectly therefrom. The present invention according to claim 1 provides an improved sanitaryware casting method comprising the steps of providing at least one shell mold selected from a plurality of shell molds; at least one engine mold selected from a plurality of engine molds; and at least one rim mold selected from a plurality of rim molds. Each mold type has a casting space for casting a unique shell, engine or rim configuration thereby. Each shell configuration includes a hollow housing space for disposition of the selected engine configuration therewithin. Subsequent to casting of the selected shell, engine and rim configurations, the selected engine is disposed in the shell housing space to form at least one shell and engine assembly. The rim is thereafter assembled with the shell and engine assembly to form at least one shell, engine and rim assembly that, upon firing, comprises an integral piece of sanitaryware. Any selected shell, engine and rim configuration is interchangeable with at least one of non-selected shell, engine and rim configuration to produce a plurality of said shell, engine and rim assemblies.

Bergquist does not disclose such a sanitaryware casting method and particularly does not disclose a method wherein sanitaryware pieces are separately cast and subsequently assembled to produce a variety of highly complex models from a single platform. Bergquist is silent with respect to casting of separate shell, engine and rim configurations such that a plurality of such configurations can be pre-cast and thereafter selected to form a desired shell, engine and rim assembly. Applicant refers to page 18, lines 1 to 27 of Applicant's specification and Figures 11, 12 and 13 as demonstrative of the current invention's advantage of providing multiple sanitaryware embodiments on a single platform (for instance, a single engine configuration disposed in a plurality of shell and rim configurations, a single shell configuration housing a plurality of engine configurations and supporting a plurality of rim configurations, etc.). Bergquist provides a sanitaryware casting method wherein "**an important feature** of [the] casting method

and apparatus of this invention is the connection of the rim to the cast bowl **when both are in an upside down position**, partially supported by the mold, and still greenware. This reduces deformation of the bowl and resulting waste, and permits the use of faster production rates” (Bergquist, column 5, lines 17 to 22) (emphasis added). Bergquist is therefore concerned with improvements in casting yields caused by excessive deformation rates. Bergquist does not address or imply any application of the disclosed method to improve manufacturing yields and enable accelerated production of complex bowls designs by using the toilet’s functional components (i.e., the trapway, jet and inlet and outlets) as the basis for a plurality of toilet models. With the present invention, a single manufacturing facility can easily produce multiple interchangeable platforms in the manufacture of sanitaryware to achieve a plurality of design and functional combinations. Because Bergquist does not teach, disclose or suggest a sanitaryware casting method that produces a variety of shell-engine-rim assemblies on a single production line, claim 1 is not obvious in view thereof.

In addition, Garnett, either alone or in combination with Bergquist, does not disclose, teach or suggest the casting method of the present invention according to claim 1. In the Office Action, the Examiner states, “Bergquist does not teach providing a shell mold for casting a shell into which the engine is disposed. Garnett teaches a sanitaryware assembly method comprising a molded shell (22), a molded engine (24) and a molded rim (50) which are assembled to each other to form a single piece of sanitaryware” (Office Action, November 3, 2006, page 3, para. 1, lines 8 to 11). Applicant respectfully traverses the Examiner’s rejection of claim 1 based upon Garnett.

Applicant reiterates the above comments with respect to Bergquist and adds that a person of ordinary skill in the art would not be motivated to combine Garnett with Bergquist. Garnett is directed to production of sanitaryware using die-forming and equivalent plastic-forming manufacturing processes that are amenable to the use of thin, sheetlike shell sections. The “molded engine” (24) to which the Examiner refers is one of the sheetlike members disclosed by Garnett and is not a separately cast engine member that provides the toilet’s functionality. Shell section (24) is joined with sheet section (23)

by a telescopic joint 44 “which is the only fitting between these parts” (see Garnett, column 2, lines 59 to 61). Garnett does not disclose, teach or suggest that either shell section (23) or (24) is interchangeable with various other shell section configurations or capable of being combined with a variety of engine and rim configurations to provide sanitaryware manufacturers with an expanded platform on which multiple sanitaryware designs can be constructed (i.e., a selected trapway design with a variety of bowl and rim designs, a selected aesthetic bowl design in which a variety of engine and trapway designs can be housed for various geographic regions, etc.). Garnett, in fact, requires a core member made from flowable, curable material that adheres to the shells sections and joins such sections thereby. Such material detrimentally adds weight to the bowl and promotes the bowl’s inherent deformation characteristics.

This is a drawback that Bergquist seeks to avoid. Bergquist particularly addresses the problem of deformation inherent in joining a bowl portion with a rim portion while both portions are still greenware. The Examiner, in allowing the Bergquist claims, stated that “the prior art of record does not disclose or provide motivation for a method for casting a plumbing fixture having a bowl and rim including the steps of casting the bowl portion in an upside down position and subsequently holding the bowl in side mold parts while contacting the bowl portion with the rim portion when both portions are upside down and greenware” (see Notice of Allowance, US Serial No. 09/443,513, issued April 5, 2002, p. 2, para. 5 to p. 3, lines 1 to 2). Claim 1 of the present invention does not teach inversion of the greenware elements nor does it require encapsulation of a pourable, curable material to ensure adhesion of multiple sanitaryware elements. Conversely, a person of ordinary skill in the art would not combine the teachings of Bergquist and Garnett to arrive at the invention taught by claim 1 of the present invention. Because neither Bergquist nor Garnett, either alone or in combination, discloses, teaches or suggests a casting method according to claim 1 of the present invention, claim 1 is not obvious in view thereof.

Because Since claims 2 to 5 depend directly from independent claim 1, Applicant respectfully submits that the above arguments are applicable to such claims and respectfully requests reconsideration of the rejection thereof.

4. Rejection of Claims 6 and 7 Under 35 USC 103(a)

The Examiner has rejected claims 6 and 7 of the present invention as being unpatentable for obviousness under 35 USC 103(s) over Bergquist in view of Garnett and further in view of US Patent No. 3,852,017 to Derror (“Derror”). Applicant reiterates the above arguments with respect to Bergquist and Garnett and adds the following comments.

Derror discloses an apparatus that extricates cast sanitaryware articles from multiple-piece molds. In the disclosed apparatus, a cradle is provided that if formed by opposed mold sections and that supports a green casting thereby. A tong operates in selective open and locked positions for selective engagement of at least one mold section. In this configuration, greenware “floats” in the cradle to alleviate deformation thereof.

It is unclear how the Examiner is applying this reference to claims 6 and 7 of the present invention. The Examiner refers to “conventional methods”, although the Applicant did not use this language in either claim. In addition, the Examiner does not cite the precise language in Derror that is being relied upon to reject claims 6 and 7. Applicant therefore submits that the above arguments with respect to Bergquist and Garnett are applicable and respectfully requests reconsideration of the claim rejection.

5. Rejection of Claim 8 Under 35 USC 103(a)

The Examiner has rejected independent claim 8 of the present invention as being unpatentable for obviousness under 35 USC 103(a) over Bergquist in view of Garnett.

Applicant reiterates the above arguments with respect to claims 1 to 5 and adds the claim 8 of the present invention provides a method for casting a plurality of sanitaryware designs from interchangeable elements. In the disclosed method, a series of molds for making the interchangeable elements is provided wherein the molds including a plurality of shell molds, a plurality of engine molds and a plurality of rim molds. Each of the shell molds, engine molds and rim molds has a casting space for casting a unique respective configuration thereby, with the shell in particular having a hollow housing space for disposition of a selected engine configuration therewithin. At least one of the plurality of shell, engine and rim molds is selected to produce at least one corresponding interchangeable element thereby, which interchangeable element is separately casting in the selected configuration. A cast engine configuration (either pre-cast or newly cast from a selected engine mold) is disposed in the shell housing space to form at least one shell and engine assembly thereby. A selected cast rim configuration is assembled with said shell and engine assembly to form at least one shell, engine and rim assembly such that, upon firing, said shell, engine and rim assembly forms an integral piece of sanitaryware. At least one corresponding interchangeable element is interchangeable with any selected configuration of the engine, shell or rim to produce said plurality of sanitaryware designs therefrom. One or more of these steps may be repeated until a desired number of sanitaryware designs are produced thereby.

Neither Bergquist nor Garnet, either alone or in combination, discloses, teaches or suggests the casting method according to claim 8 of the present invention. Bergquist addresses the necessity for inversion of a greenware bowl and rim prior to joining thereof while side mold parts retain the bowl portion. Garnett addresses a process of forming sanitaryware by die-forming techniques, wherein a flowable, curable liquid serves as a core material for thin, sheetlike shell portions. Neither reference discusses a method of casting multiple shell, engine and rim embodiments in a single technique to derive multiple sanitaryware configurations, wherein the sanitaryware elements are interchangeable to manufacture multiple aesthetic and technical configurations.

In the present invention, the manufacturer has a plurality of shell, engine and rim molds, each of which defines a casting space to produce a unique configuration thereby. Prior to performing any casting steps, the manufacturer selects the desired configuration for the shell, engine and rim that will be needed to produce a sanitaryware piece such as a toilet. Unlike conventional casting methods, the present invention according to claim 8 permits selective volume production of a large variety of bowls of complex design. The toilet bowl cast according to the method of the present invention is designed to ensure that the walls of the cast piece are solid throughout and can be assembled to produce complex structures that remain free of defects and design limitations. The present inventive system advantageously provides multiple, interchangeable embodiments of the primary components (shell, engine and rim) and requires existing slip recipes and molds to produce complex parts and designs. All pieces or segments are solid cast and therefore under similar stresses, unlike current processes that employ a mix of solid and hollow cast areas that create stress and consequential losses that lower manufacturing performance.

Applicant further refers to Figures 11, 12 and 13 of the present application as showing sample combinations of different shell, engine and rim configurations that are possible using the present inventive method. Figure 11 shows possible combinations of a single engine configuration with different shell and rim configurations. Figure 12 similarly shows possible combinations of a single shell configuration with a single rim configuration and different engine configurations (wherein the engine configuration is selected in consideration of local regulations and performance requirements). Figure 13 shows multiple possible combinations of shell configurations, engine configurations and rim configurations. The shell, engine and rim configurations are thereby interchangeable in consideration of the ultimate geographic region in which sanitaryware will be sold. A sanitaryware manufacturing facility can thereby satisfy the diverging aesthetic demand across different geographic regions yet comply with the local regulations of each region in which such sanitaryware is sold.

Because neither Bergquist nor Garnett, either alone or in combination, discloses, teaches or suggests a casting method wherein interchangeable elements are produced and selectively incorporated in a sanitaryware piece to achieve a plurality of sanitaryware designs, claim 8 of the present invention is not obvious in view thereof.

6. Rejection of Claims 9 and 10 Under 103(a)

The Examiner has rejected claims 9 and 10 as being unpatentable for obviousness under 35 USC 103(a) over Bergquist in view of Garnett and in further view of Applicant Admitted Prior Art (AAPA). Applicant reiterates the above arguments with respect to Bergquist and Garnett and adds the following comments.

The Examiner has defined the AAPA as page 6, lines 7 to 9 and lines 15 to 17 of Applicant's specification. Lines 7 to 9 state:

Integration of platforms in manufacturing strategies is well known in several industries for implementing common underlying structure as the basis for multiple, varying products.

Lines 15 to 17 state:

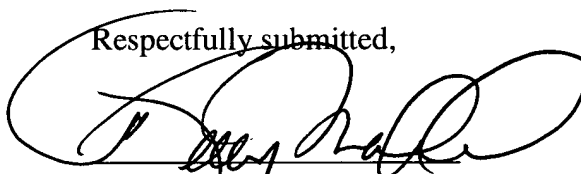
Dependence upon platforms therefore enables auto manufacturers to market substantially similar vehicles to different market segments while recovering research and developments costs.

As there is no motivation for a person of ordinary skill in the art to combine Bergquist and Garnett, there is certainly no motivation for such person to further combine these references with the automotive industry reference cited by applicant. The examiner does not cite the precise claim language to which the AAPA is applied and simply refers to "the platform-manufacturing concept of claims 9 and 10" (Office Action, page 5, para. 7, line 2 under the heading "Claims 9 and 10"). Neither Bergquist nor Garnett employs or even suggests platform techniques in the production of sanitaryware and, in fact, such techniques would impede the successful practice of the methods taught by these references. Such combination is an improper application of

non-analogous art and in fact, it was only by Applicant's disclosure that such motivation to combine can be seen. Because it is improper to apply hindsight in the combination of references, Applicant submits that claims 9 and 10 are not obvious in view of the cited references and the AAPA.

Applicant believes the claims are in condition for allowance and respectfully requests reconsideration of the claims. Applicant invites the Examiner to contact Applicant's undersigned representative should the Examiner have any questions or require further information regarding this application.

Respectfully submitted,

A large, stylized handwritten signature in black ink, appearing to read 'Kelly Merkey', is written over the typed name and address.

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